Improving Pediatric CPR Rate Compliance

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INTRODUCTION

Each year, over 15,000 children receive cardiopulmonary resuscitation (CPR) in a hospital setting. As clinicians, our priority is to deliver high-quality CPR to maximize survival rates—most importantly, survival with good neurological outcomes.

One key component of high-quality CPR is maintaining the correct chest compression rate. According to American Heart Association (AHA) Pediatric Advanced Life Support (PALS) guidelines, the recommended compression rate is 100–120 beats per minute (bpm). When using Zoll OneStep™ pads during resuscitation events, we can track CPR performance metrics, including the percentage of time the compression rate remains within the recommended range.

The **AHA goal** is for this percentage to be **greater than 80%**. However, before implementing this project, the mean compliance rate was **43.6%**.

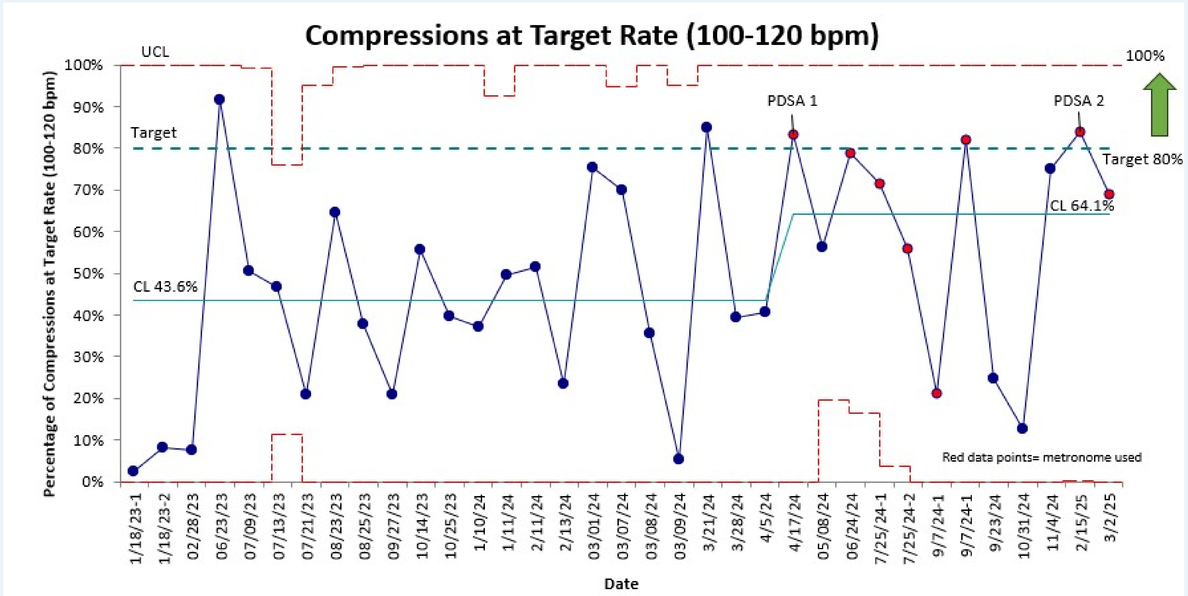
The aim of this project was to improve pediatric CPR rate compliance by **20% over 12 months** through the implementation of a metronome. This initiative included pediatric patients under 20 years of age.

METHODS

The first PDSA cycle began in April 2024 with the introduction of a portable metronome. Pediatric SWAT nurses carried a metronome at all times, the Pediatric ED attached one to their Zoll monitors, and the PICU kept one at the nurses' station. However, challenges arose, including unreliable battery life and difficulties ensuring a metronome was always available in the trauma bay.

In response, the second PDSA cycle focused on evaluating the built-in metronome feature of the Zoll R-Series. A brief pilot study was conducted in Unit 12F, leading to the feature being activated on all Zoll defibrillators across our institution in January 2025.

RESULTS



Discussion

An overall improvement of 20.5% is shown with the center line shift after the implementation of the portable metronome in April 2024 (PDSA cycle 1).

Portable metronome

Zoll R-Series

Results

An overall improvement in CPR rate compliance was observed with the use of the metronome.

Enabling the metronome feature on the Zoll will help maintain compliance, provided that Zoll OneStep™ pads are used during the event.

A t-test was performed to compare the percentage of on-target CPR rate between cases where a metronome was used and where it was not. The mean difference between groups was 26.5% (95% CI: 7%–45%), with a statistically significant p-value of 0.011

Additional training will be necessary to familiarize staff with recognizing the metronome cues and maintaining the correct pacing.

Future Steps

Continue monitoring and analyzing CPR performance data to identify trends and areas for improvement.

Educate staff on the critical role of the CPR coach in optimizing performance.

Track improvements in balancing measures, such as CPR depth, to ensure overall quality.

Integrate CPR simulation training to enhance skill proficiency and readiness.

References

Morgan, R. W., Kirschen, M. P., Kilbaugh, T. J., Sutton, R. M., & Topjian, A. A. (2021). Pediatric In-Hospital Cardiac Arrest and Cardiopulmonary Resuscitation in the United States: A Review. *JAMA pediatrics*, *175*(3), 293–302. https://doi.org/10.1001/jamapediatrics.2020.5039